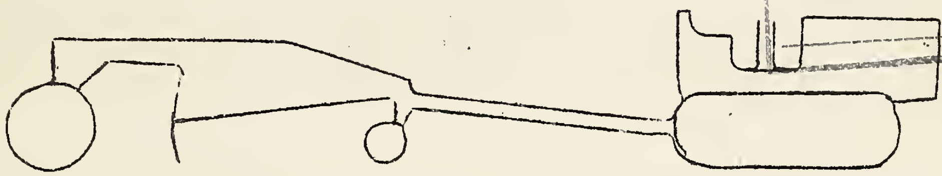
CONSTRUCTION



HINTS

UNITED STATES DEPARTMENT OF AGRICULTURE, FOREST SERVICE

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CLEANING BEARING HOUSINGS

R. S. Henderson - Washington Office

In overhauling equipment it is usually desirable to flush out the bearing housings, especially those of the anti-friction type, to remove foreign matter and any lubricant which has become hardened or gummed.

In those instances where the equipment cannot be shut down long enough or dis-assembly is difficult, and where, if flushed with gasoline or kerosene, the remaining traces of such flushing agent might injure the seals or "cut" the new lubricant and injure the bearings, satisfactory results can be obtained by using a flushing agent of thin machine oil heated to about 200° F. This has almost the same cleaning properties as gasoline and remaining traces, when drained, cannot cause damage.

The arc welder can be transported from the shop to the job by removing the iron wheel trailer and equipping with a two wheel trailer made from that old discarded truck.

(Over)

ELECTRIC CAST IRON HARD SURFACING

Submitted by L. B. Smith, R.O. Shop Welder, R-6

Cast iron applied with electric arc method is equivalent to any commercial self hardening rod, and there is a noticeable difference in price; self hardening rod is sold at 50¢ per pound, while cast iron rod sells at .08¢ per pound.

When applying cast iron rod as a hard surfacer, I prefer 1/4" round and a current amperage of about 275. Extreme care should be taken not to weave or puddle, and the application should be done swiftly. The cooling is very important, inasmuch as slow cooling tends to soften the applied surface; so therefore it should be cooled of its own accord as quickly as possible. This type of welding has very little strength, but possesses high friction resisting properties, which makes it suitable for the following parts: Dipper teeth, grader and trail-builder blades, and all other quick wearing machinery parts which wear due to friction. This type hard surfacing is extremely hard and cannot be machined, but it can be ground smooth.

About a year ago, I helped repair a dragline bucket for the Forest Service, which actually used commercial self hardening rod costing $25,00, and I have just completed the same type job for $6.00. In the latter case we used the standard cast iron 1/4" round rod, making a saving of $19.00.

TELEPHONE LINE INSTALLATION FOR LOOKOUT TOWERS

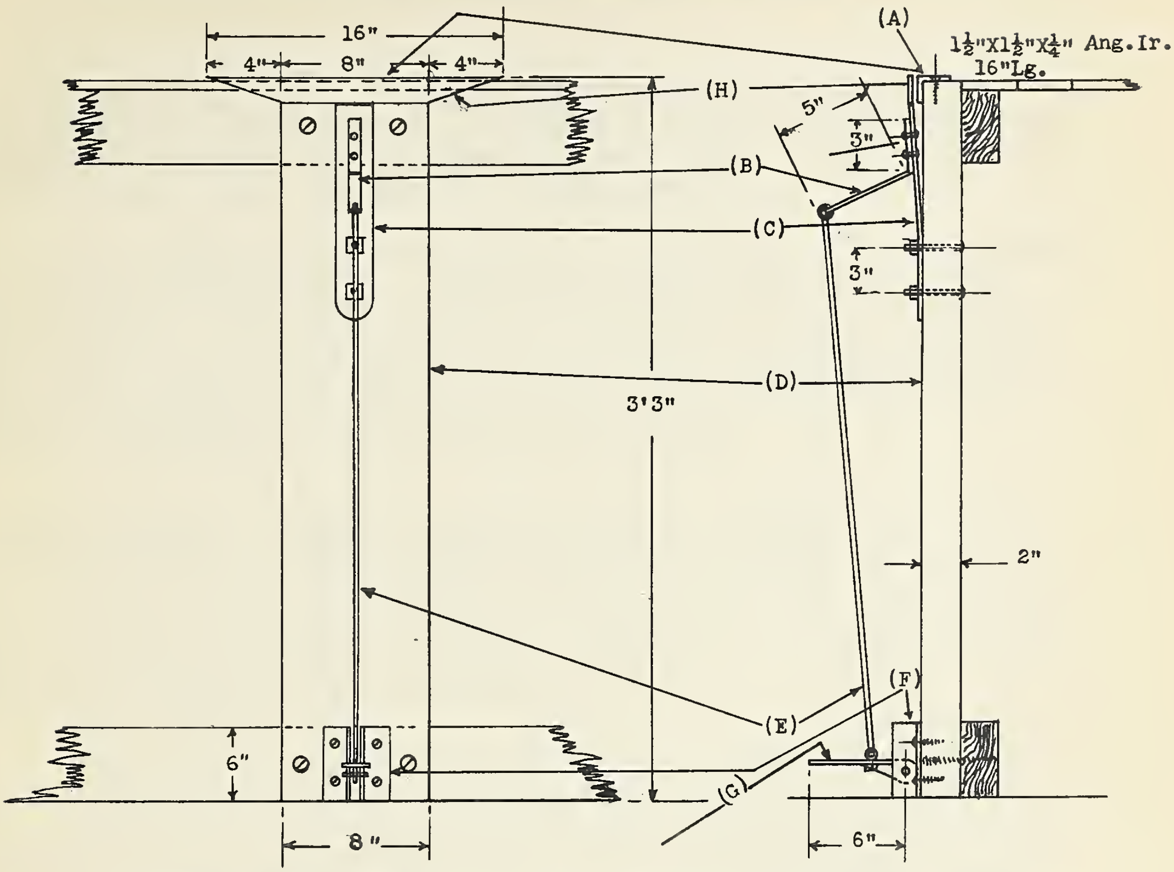
Submitted by Gerald S. Horton, Forest Supervisor, R-9

The installation of telephone lead-in wires on lookout towers has been made on the Shawnee by using lead covered duplex copper wire attached to the inside of the tower leg by "U" type copper connector. In this manner the line wires are not visible and a neater job of construction is done.

The cable can either be run underground to the telephone pole, or spliced to copper duplex wire and this wire stretched from the lower part of the tower to the pole.

It is necessary that a large hole be bored in the copper connector to fit the regular tower bolts. Connectors are placed at each section of the tower in order to hold the cable close and take up the weight of the cable.

TOOL FOR HOLDING SAWS FOR SHARPENING, TO BE ATTACHED TO WORK BENCH.



In assembling Saw Clamp Part (D) 2" plank $38\frac{3}{4}$" long to be screwed to work bench, setting part (A) $1\frac{1}{2}$"x$1\frac{1}{2}$"x$\frac{1}{4}$" angle iron, holding in place with two (2) wood screws on top of Part (D). Part (C) $\frac{1}{4}$"x$1\frac{1}{2}$", Spring steel, $11\frac{3}{4}$" long to have part (H) butt welded to same, then rivet Part (B) $\frac{3}{4}$"x8" band iron on part (C), then bolt entire assembly to part (D). Part (H) $1\frac{1}{4}$"x$\frac{1}{4}$" Spring steel.

Next set Parts (F) $1\frac{1}{2}$"x$1\frac{1}{2}$"x$\frac{1}{4}$" Angle iron in position as shown on bottom of Part (D). Fastening parts with wood screws, leaving sufficient space to insert part (G) $1\frac{1}{2}$"x$\frac{1}{4}$" band iron 6" long, with hole drilled for placing in shaft as axis; also hole drilled for fastening eye bolt of suitable size to foot pedal or Part (G). Next Part (E) to cut to size forming ring on upper and to fit in hole on part (B), then cutting to length allowing for additional length to form hook to fit in hole on part (G).

When completely assembled, with no pressure on part (G), Part (H) to be tightly pressed to Part (A), with angle of (G) slightly higher than horizontal, allowing sufficient space for Part (G) to be pressed down, thereby opening up jaws of clamp. When pressure is applied to Part (G), Part (E) is drawn down in turn pulling Part (B) down forcing open jaws of clamp; when saw is inserted in jaws of open clamp, release pressure on part (G) and jaws of clamp will hold saw in position.

Designed and Fabricated by:- Martin Tiers, Ass't Blacksmith,
Camp S-54, Butler, N. J.

Drawn by:- Paul R. Marron, Foreman.

A REMEDY FOR TILE TROUBLE IN WATERS OF MEDICINE LAKE
From U. S. Department of Agriculture Press Release
dated April 21, 1936.

Beneath the alkali waters of Medicine Lake, near Watertown, S.D., lie thousands of small concrete cylinders and drain tile--placed there by engineers of the U. S. Department of Agriculture to determine what concretes best resist destruction by alkali salts.

About 1919, concrete tile drains in farm lands of soutwest Minnesota were reported failing. Examination showed deterioration from alkali salts in the soil--the alkali eating out the lime of the cement in the concrete. Development of resistant concretes by the Bureau of Agricultural Engineering began at laboratories established in 1921 at University Farm, St. Paul, in cooperation with the University of Minnesota and the Minnesota Department of Conservation.

Although the experiments are by no means finished, it already has been shown that concrete products cured at a temperature of 100 to 150 degrees F. can be made much more alkali resistant at small cost-about 1/5 of a cent per foot for 6-inch tile--by adding calcium chloride to the mix. Concrete tile made and cured by this method are still good after 3 years in Medicine Lake. Similar tile without this treatment went to pieces in less than a year.

Medicine Lake, 300 or 400 acres of clear water, with stretches of gravel beach, is an ideal and inexpensive laboratory for testing the resistance of concretes to alkali salts. It has a concentration of magnesium and sodium sulphates--the salts that have caused trouble in Minnesota--much greater than that of soil water ordinarily found in agricultural lands.

To develop the highest resistance in draintile, sewer pipe and other concrete products, they should be steam cured when 12 to 24 hours old at temperatures of 212 F. for 48 hours or longer. Higher temperatures are more effective so that at 350° F. a 6 hour curing period gives remarkable results.

Still other ways of making concrete products more alkali resistant have been developed, but few of them are as inexpensive as the use of calcium chloride, in conjunction with moderately high curing temperatures.

Work in the laboratory has shown that Portland cements themselves vary greatly in alkali resistance and cements from all parts of the United States are being tested. Bidders for cement for the Fort Peck dam on the Missouri River were asked to state whether their product had been tested in the St. Paul Laboratory.

"Because of the extreme dry weather in recent years, very little water has been carried by most tile lines", says S. H. McCrory, chief of the Bureau of Agricultural Engineering, "but the return of

(Continued on Page 4)

wetter seasons undoubtedly will show that many improperly made concrete drains crumbled long ago.

"Since 1921 there have been no failures of concrete tile in any public ditch in Minnesota where engineers for the ditches cooperated with the laboratory at St. Paul. About 1250 miles of tile have been laid at a cost of nearly $4,000,000. For about 75 percent of it the laboratory gave assistance."

Studies now are being made at the laboratory to show what effect calcium chloride will have in tile exposed to the action of the acid peat and muck soils, of which there are nearly 7,000,000 acres in Minnesota alone. Ordinary concrete tile after 11 years in a high acid peat have failed completely.

The action of acids in silage on concrete stave silos and other silos made of concrete or using Portland cement mortar at the joints, is being studied. Silos, improperly built, are ready to crumble after 10 or 15 years. Deterioration from acids is particularly noticeable around the doors and at the extreme bottom of the interior.

In 1925 the laboratory also began the study of frost action on clay drain tile. Engineers hope that the use of clay tile of the smaller sizes, more resistant to frost than many of those now sold, can be encouraged.

Preventing Breakage in Hose Lines

Region 8 reports that the Ozark Forest experienced difficulty with the 1935 model Garwood trailbuilders because of the breaking of the ends of the pipe connecting the high pressure hose. This occurred even after the pressure relief valves were adjusted according to the suggestion made by Region 9.

To overcome the trouble, high pressure hose 24 inches in length was substituted for the pipe. No further trouble was experienced.